

USSN 10/699,289

PATENT

-11-

Remarks

Following this Amendment, claims 2-9, 11-14 and 19-27 are active in the application.

I. ELECTION/RESTRICTION

The applicant notes with appreciation the Examiner's indication that the restriction between Groups I and II is improper and that the claims in both Group I and Group II would be examined.

II. SPECIFICATION

The amendments to the specification set forth above address the objections to the specification set forth in the official action. The applicant has additionally amended the summary of the invention and the abstract to conform them to the amended claims.

III. ALLOWABLE SUBJECT MATTER

The applicant notes with appreciation the Examiner's indication that Claims 23 and 27 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. The applicant has amended Claims 23 and 27 in the manner suggested and respectfully submit that Claims 23 and 27 as now amended are allowable.

IV. PROVISIONAL OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTION

Claims 1, 3-10, 14 and 15-17 are provisionally rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2-9, 9 and 10-12, respectively, of copending United States patent application serial no. 10/699,481. In an Amendment filed on 23 May 2005 in United States patent application serial no. 10/669,481, the applicants in that application cancelled Claims 1, 2, 9 and 10, and amended Claims 3, 5-8 and 11 of that application. The applicant respectfully submits that the cancellations and amendments render moot the rejection of Claims 1, 3-10 and 14-17 and 12 under the judicially-created doctrine of obviousness-type double patenting and respectfully requests that this rejection be withdrawn.

BEST AVAILABLE COPY

USSN 10/699,289

PATENT

-12-

V. CLAIM REJECTIONS UNDER 35 USC § 102

Claims 1, 3, 10, 14-16, 18 and 26 are rejected under 35 USC § 102(b) as being anticipated by United States patent no. 3,568,108 of Poirier et al. (*Poirier*)

Claims 1-6, 10, 14-16, 18, 24 and 26 are rejected under 35 U.S.C. § 102(e) as being anticipated by United States patent no. 6,720,844 of Lakin.

Claims 1, 3-6 and 19-22 are rejected under 35 USC § 102(e) as being anticipated by 6,670,866 of Ellä et al. (*Ellä*).

The applicant has cancelled Claim 1 and has rewritten Claim 3 in independent form, additionally incorporating the subject matter recited in Claim 10. The applicant has further amended Claim 3 to recite that the acoustic decoupler comprises a single layer of acoustic decoupling material. The applicant respectfully submits that none of the cited references discloses all of the claim limitations recited in Claim 3 as now amended, and that Claim 3 and the claims that depend on Claim 3 are therefore patentable.

Poirier's drawing shows multiple layers 53 and 54 between resonators 41 and 42. Poirier describes layers 53 and 54 as having a thickness between $(n+1)\lambda/2$ and $(2n+1)\lambda/4$ (col. 3, lines 51-53). Later, Poirier refers to layers 53 and 54 as "half wavelength layers" (col. 3, line 65).

Lakin's Figure 3 shows a Bragg structure composed of multiple quarter-wave layers 350, 351 and 352 between resonators 300 and 313. As noted in the official action, Lakin indicates that fewer layers may be used. However, the applicant respectfully submits that the over-coupled response shown in curve 83 of Lakin's Figure 8 indicates that the single layer disclosed by Lakin is not an effective acoustic decoupler.

Ellä's Figure 7 shows a single half-wave layer 50 (see col. 10, lines 26-29) between two resonators having piezoelectric elements 42 and 62.

Accordingly, the applicant respectfully submits that none of the cited references teaches or suggests the acoustic decoupler structure recited in Claim 3 as now amended. The applicant therefore respectfully submits that Claim 3 and the claims that depend on Claim 3 are patentable.

Additionally, the applicant has amended Claim 24 to recite in part "between the FBARs, a single layer of acoustic decoupling material ..." The applicant respectfully submits that none of

USSN 10/699,289

PATENT

-13-

the cited references teaches or suggests "between the FBARs, a single layer of acoustic decoupling material ..." as recited in Claim 24 as now amended. The applicant therefore respectfully submits that Claim 24 and Claim 25 that depends on Claim 24 are patentable.

Additionally, the applicant has amended Claim 26 to recite that the coupling of less acoustic energy between the FBARs than would be coupled by direct contact between the FBARs is "by no more than one layer of acoustic decoupling material located between the FBARs." As noted above, Poirier and Lakin show a Bragg structure comprising multiple layers between their resonators. Accordingly, the applicant respectfully submits that neither Poirier nor Lakin teaches or suggests such coupling.

The applicant respectfully notes that Ellä shows a single layer between resonators, but that Ellä teaches that this single layer has an optimum thickness of $\lambda/2$ and that acoustic losses should be minimized. It is known in the acoustic arts that a layer having a thickness of $\lambda/2$ is acoustically transparent. Ellä's balun is therefore acoustically equivalent to the conventional SBAR shown in Figure 3 of the applicant's disclosure, and has a frequency response similar to that shown at 46 in Figure 4 of the application. Coupling less acoustic energy between the FBARs than would be coupled by direct contact between the FBARs, as recited in Claim 26, provides the desirable band-pass filter characteristic shown at 48 in Figure 4 of the application. The applicant respectfully submits that Ellä's element 50 is not an acoustic decoupler in the sense the term is used in the application and that Ellä's element 50 does not couple substantially less energy between the FBARs than would be coupled by direct contact between the FBARs. Instead, Ellä's element 50 simply serves to provide electrical isolation between primary and secondary in the balun disclosed by Ellä. Accordingly, the applicant respectfully submits that Ellä neither teaches nor suggests "coupling of less acoustic energy between the FBARs than would be coupled by direct contact between the FBARs," as recited in Claim 26. The applicant therefore respectfully submits that Claim 26 and the claims that depend on Claim 26 are patentable.

VI. CLAIM REJECTIONS UNDER 35 USC § 103(a)

Claims 7-9, 11-13, 17 and 25 are rejected under 35 USC § 103(a) as being unpatentable.

USSN 10/699,289

PATENT

-14-

over Lakin in view of United States patent no. 6,278,342 of Ellä (Ellä '342). The applicant has cancelled claim 17.

The official action admits that Lakin does not disclose the layer of acoustic decoupling material comprising plastic, polyimide, or poly(para-xylylene) and looks to Ellä '342 for a disclosure of polymers used as the low acoustic impedance material. The official action states:

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the filter of Lakin (Fig. 3) by having used electrodes (303 and 314) of the resonators as high acoustic impedance layers, and by having replaced one or more of the low acoustic impedance decoupling layers (350, 352) with a plastic or polymer such as polyimide or parylene in view of the explicit suggestion to use these materials in such Bragg structures by Ellä (col. 3, lines 18-33 and col. 9, lines 22-27 and 33-40) and the explicit suggestion by Ellä to use electrodes of the resonators as high impedance layers (col. 3, lines 46-48).

The applicant respectfully submits that the rejection of Claims 7-9, 11-13 and 25 under 35 USC § 103(a) is improper on the ground that the *prima facie* case of obviousness set forth in the official action does not comply with the requirements of MPEP § 2143. Specifically, the applicant respectfully submits that the official action does not indicate where in the cited references may be found a teaching or suggestion that would provide a motivation for the person of ordinary skill in the art to modify Lakin's filter in the manner indicated in the official action. Nor does the official action indicate where in the cited references may be found a teaching or suggestion that would provide the person of ordinary skill in the art with a reasonable expectation of success in the event such person were to attempt to modify Lakin's filter in the manner indicated in the official action. Finally, the proposed combination of references does not teach or suggest every element of the claims.

The applicant acknowledges that Ellä '342 discloses various plastic materials including polyimide (but not poly(para-xylylene)) as low acoustic impedance materials of an acoustic mirror structure. However, the official action does not indicate where in the Ellä '342 disclosure may be found a teaching or suggestion that the plastic materials disclosed therein are suitable for use as the acoustic decoupling material constituting an acoustic decoupler. The passages of the Ellä '342 cited in the official action disclosure all refer to acoustic mirror structures in which a layer of the low acoustic impedance material is sandwiched between layers of high acoustic impedance material. Moreover, the applicant has been unable to find teaching or suggestion in

USSN 10/699,289

PATENT

-15-

the passages of the Ellä '342 disclosure cited in the official action that the materials cited would be suitable for use the acoustic decoupling material constituting an acoustic decoupler. Accordingly, the applicant respectfully submits that neither a motivation to combine nor a reasonable expectation of success can be found the proposed combination of references. The applicant therefore respectfully submits that this makes the proposed combination of references improper. Accordingly, the applicant respectfully submits that the rejection of Claims 7-9, 11-13 and 25 is improper.

Furthermore, the applicant respectfully submit that, even if it were proper to modify Lakin's filter in the manner proposed in the official action, the resonators of Lakin's filter would be coupled by an acoustic Bragg structure having a polymer low impedance layer and not by "an acoustic decoupler comprising a single layer of acoustic decoupling material having a nominal thickness equal to an odd integral multiple of one quarter of the wavelength in the acoustic decoupling material of an acoustic wave having a frequency equal to the center frequency," as recited in Claim 3 and Claim 24 on which the rejected claims depend. Additionally, the applicants have been unable to find any teaching or suggestion of poly(para-xylylene), recited in Claims 9 and 13, in the Ellä '342 disclosure. Accordingly, the applicant respectfully submits that the rejection of Claims 7-9, 11-13 and 25 is improper because the proposed combination of references neither teaches nor suggests all the claim limitations.

Accordingly, the applicant respectfully submits that the rejection of Claims 7-9, 11-13 and 25 is improper and respectfully requests that the rejection be withdrawn.

The applicant respectfully requests reconsideration of the rejected claims. The applicant believes that the application as now amended is in condition for allowance, and respectfully requests such favorable action. If any matters remain outstanding in the application, the Examiner is respectfully invited to telephone the applicant's attorney at (650) 485-3015 so that these matters may be resolved.

USSN 10/699,289

PATENT

-16-

Respectfully submitted,
John D. Larson III et al.

By: /Ian Hardcastle/

Ian Hardcastle
Reg. No. 34,075

Agilent Technologies, Inc.
Legal Department, MS DL429
P.O. Box 7599
Loveland, CO 80537-0599

Dated: 15 June 2005

Tel.: (650) 485-3015

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.